

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A method for determining positional relationships among objects represented in a database, the method comprising:

defining a plurality of tiles;

determining a distribution of the objects with respect to the tiles by identifying as interior tiles those tiles that intersect the object while all of a boundary of the object lies outside the interior tiles and by identifying as boundary tiles those tiles that intersect a boundary of the object;

identifying a first object as fulfilling a primary filter condition with respect to a second object if at least one tile of the first object intersects with at least one tile of the second object; and

identifying the first object as fulfilling a secondary filter condition with respect to the second object if the at least one tile of the second object with which the at least one tile of the first object intersects is an interior tile of the second object.

2. (cancelled)

3. (cancelled)

4. (previously presented) The method according to claim 1, wherein the primary filter condition includes at least one member selected from the group comprising:

- a first object in a second object, a second object contained by a first object,
- a first object in a second object where a boundary of the first object intersects a boundary of the second object,
- a first object covering a second object where a boundary of the first object intersects a boundary of the second object,
- a first object outside a second object where a boundary of the first object intersects a boundary of the second object,
- a first object does not cover a second object where a boundary of the first object intersects a boundary of the second object,
- a first object overlaps a second object but the boundaries of the first object and the second object do not touch,
- a first object overlaps a second object and the boundaries of the first object and the second object touch,
- a first object is equivalent to a second object, and
- a first object is disjoint from a second object.

5. (cancelled)

6. (cancelled)

7. (original) The method according to claim 1, wherein the tiles all have at least one of the same size and the same shape.

8. (original) The method according to claim 7, wherein the tiles are rectangular.

9. (original) The method according to claim 1, wherein the tiles have different sizes.

10. (original) The method according to claim 1, wherein the database comprises geometries of the objects on a surface or in a three-dimensional space.

11. (original) The method according to claim 10, wherein the database stores the exact geometries and approximations of the geometries.

12. (original) The method according to claim 1, wherein geometries comprise polygons and the method determines positional relationships among polygons.

13. (original) The method according to claim 11, wherein the geometries comprise linestrings and polygons and the method determines positional relationships among the polygons.

14. (original) The method according to claim 13, wherein the linestrings represent streets and the polygons represent a geographic region, and the method determines streets that at least partially fall within the geographic region.

15. (original) The method according to claim 14, wherein the geographic region includes a member selected from the group comprising counties, cities, and zip code regions.

16. (cancelled)

17. (previously presented) The method according to claim 1, wherein the objects are organized with a linear quadtree index.

18. (previously presented) The method according to claim 1, wherein the secondary filter condition is applied only to a subset of objects fulfilling the primary filter condition.

19. (previously presented) The method according to claim 1, further comprising:

assigning each tile, a tile code and an associated geometry as the tiles are defined.

20. (previously presented) A computer program product for performing a process for determining positional relationships among objects represented in a database in a computer system, comprising:

a computer readable medium; and
computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of
determining a distribution of the objects with respect to the tiles by identifying as interior tiles those tiles that intersect the object while all of a boundary of the object lies outside the interior tiles and by identifying as boundary tiles those tiles that intersect a boundary of the object;

identifying a first object as fulfilling a primary filter condition with respect to a second object if at least one tile of the first object intersects with at least one tile of the second object; and

identifying the first object as fulfilling a secondary filter condition with respect to the second object if the at least one tile of the second object with which

the at least one tile of the first object intersects is an interior tile of the second object.

21. (previously presented) A system for performing a process method for determining positional relationships among objects represented in a database, comprising:

a processor operable to execute computer program instructions; and

a memory operable to store computer program instructions executable by the processor, for performing the steps of:

determining a distribution of the objects with respect to the tiles by identifying as interior tiles those tiles that intersect the object while all of a boundary of the object lies outside the interior tiles and by identifying as boundary tiles those tiles that intersect a boundary of the object;

identifying a first object as fulfilling a primary filter condition with respect to a second object if at least one tile of the first object intersects with at least one tile of the second object; and

identifying the first object as fulfilling a secondary filter condition with respect to the second object if the at least one tile of the second object with which the at least one tile of the first object intersects is an interior tile of the second object.

22. (currently amended) The method of claim 1, further comprising the steps of:

determining whether the first object fulfills a secondary filter condition with respect to the second object by ~~mathematically~~ exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second object that intersect with the at least one tile of the first object is an interior tile of the second object.

23. (currently amended) The computer program product of claim 20, further comprising the steps of:

determining whether the first object fulfills a secondary filter condition with respect to the second object by ~~mathematically~~ exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second object that intersect with the at least one tile of the first object is an interior tile of the second object.

24. (currently amended) The system of claim 21, further comprising the steps of:

determining whether the first object fulfills a secondary filter condition with respect to the second object by ~~mathematically~~ exactly comparing a geometry of the first object with a geometry of the second object if none of the tiles of the second object that intersect with the at least one tile of the first object is an interior tile of the second object.